IN THE SPECIFICATION:

1) Please replace ¶ [0020] with the following amended paragraph:

[0020] We then apply this to the bias estimation to get sequential estimation of state-dependent biases. We introduce a state-dependent bias l_j attached to each state j, we express the Gaussian ~~power~~ probability density function (pdf) of the state j mixture m as

$$b_{jm}(o_t) = N\left(o_t;\ \mu_{jm} + l_j,\ \sum_{jm}\right) \tag{5}$$

$$= \frac{1}{(2\pi)^{\frac{n}{2}} \left|\sum_{jm}\right|^{\frac{1}{2}}} e^{-\frac{1}{2}(o_t - \mu_{jm} - l_j)^T \sum_{jm}^{-1}(o_t - \mu_{jm} - l_j)}$$

2) Please replace ¶ [0023] with the following amended paragraph:

[0023] Ignoring the items that are independent of l_j's we define Q-function as

$$Q_{k+1}(\Theta_k, l_j) = \sum_{t=1}^{T^{k+1}} \sum_j \sum_m P\left(\eta_t = j, \varepsilon_t = m \,\middle|\, o_1^{T^{k+1}}, \Theta_k\right) \log b_{jm}(o_t) \tag{7}$$

$$= \sum_{t=1}^{T^{k+1}} \sum_j \sum_m \gamma_{k+1,\underline{t}}(j,m) \log b_{jm}(o_t) \tag{8}$$